3. Proposed Action and Alternatives

A number of actions, each an integral part of an overall action collectively called the Coyote Springs Cogeneration Project, are described below. More extensive descriptions for actions that have environmental consequences are provided later in this section.

3.1 Proposed Action

The BPA/PGE Transmission Agreement Would be Revised - BPA proposes to revise its general transmission agreement with PGE to establish Coyote Springs Plant as a point of interconnection for wheeling services. BPA and PGE currently have a transmission agreement through which PGE's power is delivered over BPA transmission lines. If BPA decides to wheel power from the plant, this agreement would be revised and authorized. The revised agreement would cover wheeling for power from the first combustion turbine at the plant. The timing of the second combustion turbine is uncertain. If PGE decides to complete the second combustion turbine, BPA will evaluate the transmission system, and provided sufficient capacity exists, modify the transmission agreement again. If BPA determines that it does not have sufficient transmission capacity to integrate the second unit, a range of options would be considered. Solutions would range from providing non-firm service (no new facilities), to building new transmission or substation facilities. Supplemental environmental analysis would be undertaken if new facilities are proposed.

BPA's Transmission System Would be Modified - BPA proposes to modify its transmission system to connect Phase I of the new Coyote Springs Cogeneration Plant to BPA's main transmission grid. A transmission line tap and loop line is proposed to connect the plant with BPA's McNary-Slatt 500-kV transmission line. Microwave communication facilities to connect the plant with the existing network that operates BPA's transmission system would be installed at the plant and other remote sites.

PGE Would Build a 440 aMW Cogeneration Plant - PGE proposes to build a 440 aMW cogeneration plant on a site within the Port of Morrow (Port) Industrial Park near the City of Boardman, Oregon. The project would be built in phases. The first combustion turbine (220 aMW) would be built as quickly as possible. Timing for the second combustion turbine is uncertain. Associated facilities that would be installed at the plant site include an electrical substation, water storage tanks, cooling towers, workshop, warehouse and administrative offices.

PGE Would Design and Build a 500-kV Loop Line - PGE also proposes to build a ***double-circuit*** 500-kV transmission ***loop*** line from the ***tap*** point on BPA's transmission line to the Coyote Springs Plant, a distance of about 2.4 km (1.5 miles). Map 1 provides an overview of

(Map 2 missing)

the area and BPA's existing transmission line route. Map 2, an aerial photograph of the Coyote Springs Project area, shows the proposed locations for these facilities. Upon energization of the Coyote Springs Plant, ownership of the transmission loop line would be transferred to BPA. BPA would then own, operate and maintain the transmission line.

PGT Would Build a Gas Line to the Plant - PGT proposes to construct a 29.8-km (18.5-mile), 30-cm (12-inch) pipeline from PGT's main transmission line which runs from near the Canadian/Idaho border to Malin, Oregon. The proposed route for the gas pipeline is shown on Map 1. The purpose of the Coyote Springs Extension is to enable PGT to transport 41 billion ***British thermal units (BTUs)*** per day of natural gas to the proposed Coyote Springs Cogeneration Plant.

BPA Would Charge PGE for Transmission Wheeling Services - If the proposal is completed, power would flow from the Coyote Springs Plant into the BPA system and west to one or more points of delivery in PGE's service area. PGE would pay BPA for wheeling power from the Coyote Springs Plant to its load. If PGE pays for any portion of the cost of the new BPA-owned transmission facilities, BPA would reflect this contribution in the rate development process. Any cost associated with these facilities that is not paid by PGE would be recovered in the rates from all transmission system network users.

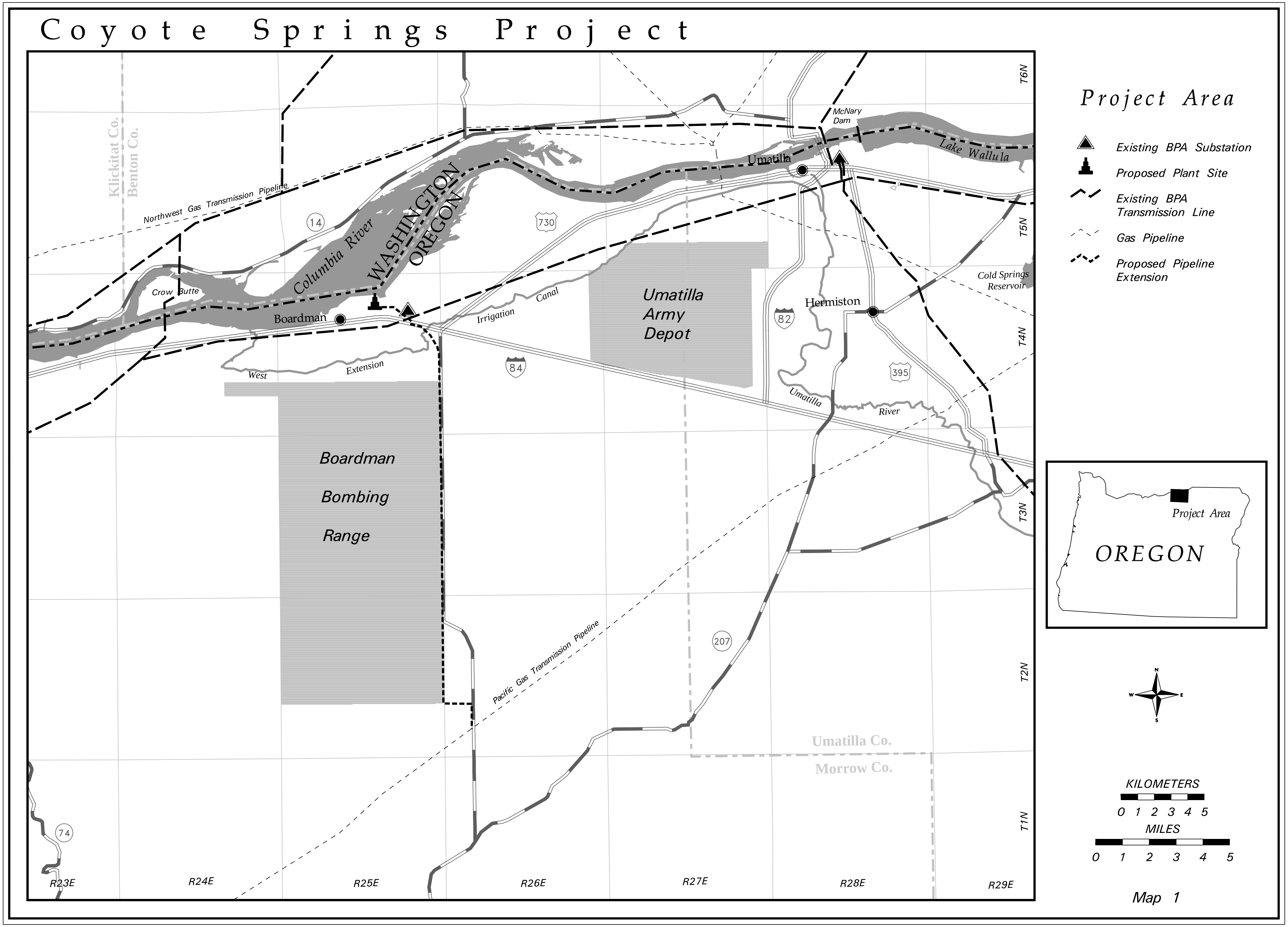
3.1.1 How the Proposed Action was Defined

The Coyote Springs Cogeneration Project was conceived in 1990 by Power Link, a subsidiary of PGE. In 1991, PGE offered output from the project to BPA under the Competitive Resource Acquisition Pilot Program in response to BPA's Request for Proposals for 300 aMW of ***firm energy***. BPA received resource proposals totalling 5,209 aMW of generation and 116 aMW of conservation. BPA did not select PGE's proposal.

In the period from November 1991 through August 1992, PGE conducted an extensive public process to develop their 1992 Integrated Resource Plan. Environmental considerations were an important consideration in development of the plan. Environmental organizations and individuals participated in an advisory group, a public policy group and in a wide range of public involvement caucuses and focus groups. In a summary of the 1992 Integrated Resource Plan, PGE lists four principles that underlie the plan: energy efficiency, cost-effectiveness, flexibility and environmental stewardship. A summary of alternate energy resources included in PGE's preferred resource strategy is provided in Section 2.1.

BPA has decided to limit its examination of overall alternatives to the proposed action and the no action alternative as it considers other resources "unreasonable" as defined in CEQ's NEPA Regulations. BPA's letter to the Environmental Protection Agency (see Chapter 9) provides added information on this topic. (See PGE's 1992 Integrated Resource Plan for additional information on PGE resource alternatives.)

Map 1. Project Area.



In early 1993, with their 1992 Integrated Resource Plan complete, PGE decided to proceed independently with the Coyote Springs Cogeneration Project to partially replace energy formerly provided by Trojan. An existing BPA transmission line corridor passes near the proposed plant site. PGE has requested transmission wheeling services from BPA to deliver energy from Phase I of the proposed project to the Portland, Oregon metropolitan area. BPA electrical system planners evaluated the transmission system and determined there was surplus capacity under most operating conditions to provide wheeling services for generation from the first of the two turbines proposed.

Because BPA will not acquire energy from the project, this EIS does not consider other generation resources, load shaping, fuel switching or conservation.

3.1.2 Location of the Proposed Project

The proposed project will be east of the City of Boardman, Oregon in the northern half of Section 10, Township 4 North, Range 25 East of the Willamette Meridian in Morrow County, Oregon. The plant would be within the Port of Morrow Industrial Park, about 190 m (625 ft.) south of the Columbia River.

The cogeneration plant will be on an approximately 9-ha (22-acre) site within the Port of Morrow Industrial Park. The site is bordered on the west by Ullman Boulevard, on the north by the Union Pacific Railroad, on the east by a Port water storage pond and on the south by a gravel road owned and maintained by the Port.

The proposed double-circuit 500-kV transmission loop line would exit the plant substation and run east about 91 m (300 ft.) north and parallel to Umatilla Electric Cooperative's transmission lines, to an angle point within an existing concrete batch plant site. From this point the loop line would travel in a southeasterly direction to BPA's existing transmission corridor. The new transmission loop line interconnects with BPA's McNary-Slatt 500-kV transmission line immediately north of Interstate Highway 84 (I-84), just before the transmission corridor crosses the highway.

PGT's proposed pipeline route follows part of the eastern border of the Boardman Bombing Range (see Map 1). The pipeline crosses I-84 near the transmission line tap and generally follows the transmission loop line route to the Coyote Springs Plant.

3.1.3 The Coyote Springs Cogeneration Project

A detailed description of the Coyote Springs Cogeneration Project was provided by PGE in Exhibit B of PGE's *Application for Site Certificate*, submitted to Oregon's EFSC on September 16, 1993. PGE's application was modified on January 6, 1994. A summary of the project as described in PGE's application is provided in this section.

Primary Plant Components

Descriptions of plant components as shown on the Coyote Springs Project Plot Plan, Figure 3-1, are provided below. Design specifications for the components are summarized in Table 3-1.

Heat Recovery Steam Generator - The heat recovery steam generators' function is to combine the high pressure and intermediate pressure steam produced by the combustion process to generate additional electric power. One heat recovery steam generator will be provided for each gas turbine generator installed at the plant.

Combustion Turbine Generator - Two General Electric "Frame 7FA" gas turbine generators will be used. Each gas turbine generator will be installed with all auxiliary equipment, including the gas turbine itself, inlet filters, silencer compartment, hydrogen-cooled electrical generator, lube oil coolers, water injection skid, compressor water wash skid, acoustical enclosure, and complete control system.

Steam Turbine Generator - Two steam turbine generators will convert the waste heat recovered in the heat recovery steam generator into electricity. ***Superheated*** process steam will be extracted from each steam turbine generator for process needs. The process steam will be cooled as necessary to provide saturated steam to the industrial user.

Cooling Tower - A multi-cell cooling tower will reject steam cycle heat (by evaporation) from passing through the main condensers and provide cooling water for miscellaneous equipment coolers. The tower will be 18 m (60 ft.) wide, 91 m (300 ft.) long and 12 m (40 ft.) high.

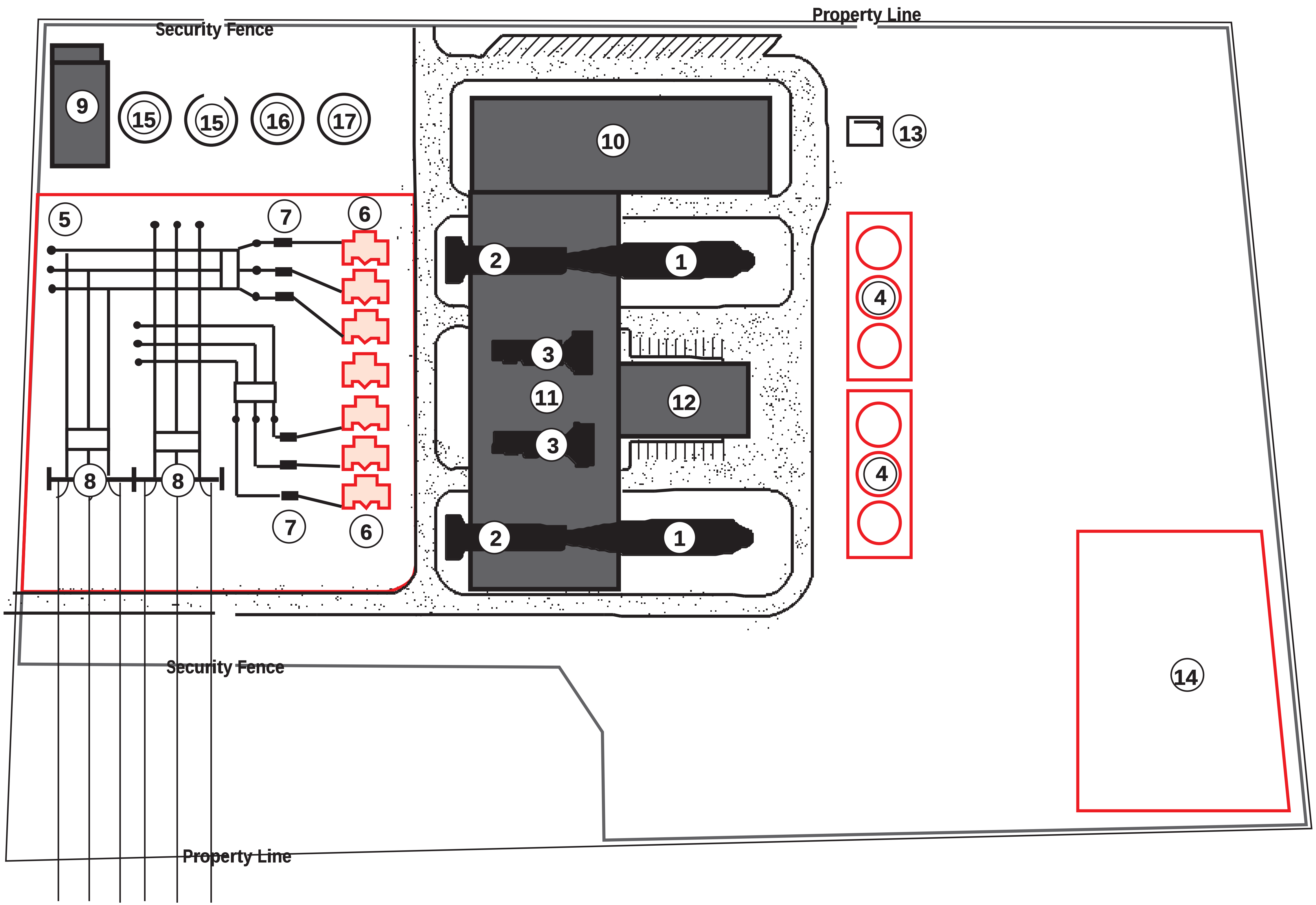
Plant Substation - A PGE substation will be built at the plant site. Substation equipment is described later on pages 3-6 and 3-9.

Auxiliary Transformers - Power for internal plant operation will be obtained through three auxiliary ***transformers***. Each of the two auxiliary transformers have the capability of supplying the station internal load under normal operating conditions. The third auxiliary transformer will have the capability of supplying power to the facility under shutdown conditions, and will provide power from a separate utility, Umatilla Electric Cooperative.

Gas Metering Building - The Gas Metering Building will register how much natural gas is used to fuel the plant. The peak fuel use for the proposed facility is expected to be 1,800 million BTUs per hour for each steam turbine or 18,000 ***therms*** (1 therm = 100,000 BTUs or 95 cubic ft. of gas).

Auxiliary Equipment Building - The Auxiliary Equipment Building will house water treatment equipment, auxiliary boilers, and associated system equipment. Two auxiliary boilers will provide backup to the facility to allow uninterrupted steam to the industrial park.

Figure 3-1. Coyote Springs Cogeneration Plant Plot Plan



Legend

1 Heat Recovery Steam Generator
2 Combustion Turbine Generator
3 Steam Turbine Generator
4 Cooling Tower
5 Plant Substation
6 Transformers
7 Power Circuit Breaker
8 Substation Dead End Structure
9 Gas Metering Building
10 Auxiliary Equipment Building
11 Main Turbine Building
12 Administration/Conrol Building
13 Ammonia Storage Tanks
14 Storm Water Detention Basin
15 Demineralized Water Tank
16 Condensate Storage Tank
17 Fire Water Storage Tank

North

Not to Scale

Source: Ebasco Services Incorporated

Main Turbine Building - The Main Turbine Building will house the two gas turbine generators, the two steam turbine generators, and the turbine auxiliary system equipment. The building will be approximately 24 m (80 ft.) high and contain approximately 4460 sq. m (48,000 sq. ft.).

Administrative/Control Building - The Administrative/Control Building will house the plant control room, administrative offices, electrical room, maintenance shop and warehouse functions. The two-story building will be approximately 930 sq. m (10,000 sq. ft.).

Ammonia Storage Tanks - Two storage tanks will store 64 m^3 (17,000 gal.) of ammonia at the facility. This amount of ammonia would provide about 40 days of continuous plant operation. The facility will use about 1.9 m^3 (510 gal.) of ammonia per day.

Stormwater Detention Basin - A stormwater detention basin will be constructed in the northeastern corner of the site. Stormwater from building roof drains and outdoor plant areas will be discharged to the Port's process water agricultural recycling system after first passing through the stormwater retention basin. The basin will have a surface area of about 1860 sq. m (20,000 sq. ft.) and will have an impervious liner to prevent leaching into the ***groundwater***.

Demineralized Water Tank - Demineralized water will be used at the facility for makeup to the steam cycle. Two 1500 m^3 (400,000 gal.) demineralized water tanks will be on-site.

Condensate Storage Tank - Condensate produced from steam will be stored in a single 1700 m^3 (450,000 gal.) storage tank on the site. Approximately 50 percent of the process steam export is expected to be returned as condensate to the facility for reuse in the steam cycle.

Fire Protection Water Storage Tank - The proposed fire water system is a pumped system. Its primary source is the Port's 7600 m^3 (2 million gal.) fresh water storage tank, about 400 m (1/4 mile) south of the proposed site. The Port's fire water system can be interconnected with the City of Boardman's domestic and fire water system, which has as its source the water tower in the City of Boardman, about 3.2 km (2 miles) away.

Coyote Springs Substation

A substation contains several different kinds of equipment arranged to carry out electrical functions, to minimize safety risk, and to accommodate operation and maintenance. The discussion below describes the equipment that would be installed at Coyote Springs Substation. Figure 3-1 shows the location of the equipment.

Power Circuit Breakers - Breakers automatically interrupt power flow on a transmission line at the time of a fault. Several kinds of breakers have been used in substations. The breakers planned for the proposed substation, called gas breakers, are insulated by special nonconducting gas (sulfur hexafluoride). Small amounts of hydraulic fluids are used to open and

Table 3-1. Major Project Components.

Plant Components	Quantity	Size/Dimensions	Other Characteristics
Combustion Turbine Generator	2	Output: 184.4 MW each	Fuel: Natural Gas. Air Emission Controls=Dry-low NOx technology.
Heat Recovery Steam Generator	2	64 m (210 ft.) exhaust stack	Ammonia injection system and selective catalytic reduction systems to reduce NOx emissions.
Steam Turbine Generator	2	Output: 79.3 MW each	Fuel: Natural Gas. Also produces steam for industrial users.
Auxiliary Boilers	2	136,078 kg (300,000 lb.) of steam/hour 55 m (180 ft.) exhaust stack	Fuel: Natural Gas. Produces steam when plant is shut down.
Cooling Tower	2	L= 91 m (300 ft.) W=18 m (60 ft.) H= 12 m (40 ft.)	Mechanical draft towers, two-speed fans force air through the towers, high-efficiency drift eliminators provided, blowdown system to remove buildup of dissolved solids. Uses 8,824 L (2,331 gal.) of water/minute. Blowdown 9,543 L (666 gal.) per minute.
Auxiliary Equipment Building	1	2230 sq. m (24,000 sq. ft.). Height:14 m (45 ft.)	Will house the water treatment and auxiliary boilers.
Main Turbine Building	1	4460 sq. m (48,000 sq. ft.). Height: 24 m (80 ft.)	Will house the combustion turbines and steam turbine generators.
Administrative Control Building	1	Two story building. 465 sq. m (5000 sq. ft.) each story. Height: 9 m (30 ft.)	Will house the control room, administration offices, electrical room, maintenance shop and a small warehouse.
Ammonia Storage Tanks	2	45.4 kL (12,000 gal.) each.	Delivered by truck to the site. Used in NOx emission control system.
Demineralized Water Tanks	2	1514 kL (400,000 gal.) Height: 8.5 m (28 ft.)	Metal tank on concrete foundation. Storage of demineralized water for use in the steam cycle.
Condensate Storage Tank	1	1703 kL (450,000 gal.) Height: 9.1 m (30 ft.)	Metal tank on concrete foundation. Storage of water condensed and returned from steam users.
Fire (Raw) Water Storage Tank	1	1136 kL (300,000 gal.) Height: 6 m (20 ft.)	Metal tank on concrete foundation. On-site storage of well water.
Transmission Components			
Plant Substation and Control House	1	Fenced yard = 195 m x 107 m (640 ft. x 350 ft.)	Outdoor, gravel surfaced, security fenced yard. Termination site for loop line. Step up transformers, power circuit breakers and sectionalizing switches located in the plant substation. The substation control house will house microwave radios, control devices, and metering equipment.
500-kV Single-Phase Step-up Transformers	7	L=12 m (40 ft.) W= 10 m (30 ft.) H=10 m (30 ft.)	The step-up transformers will boost the voltage from that of the generators to 500-kV. Each transformer contains 45,425 liters (12,000 gal. of cooling oil).
500-kV Circuit Breakers	1 initially	L= 12 m (40 ft.) W= 1.5 m (5 ft.) H= 7 m (23 ft.)	Gas insulated circuit breakers automatically interrupt the flow of electrical current. Circuit breakers are necessary to switch transmission lines open or closed for maintenance or outage conditions.
Substation Deadend Towers	2	L= 7.6 m (25 ft.) W= 24.4 m (80 ft.) H= 34.7 m (114 ft.)	Towers within the confines of the substation where incoming and outgoing transmission lines end.
Microwave Tower and Antenna	1	H= 38 m (125 ft.)	Steel structure to elevate microwave antenna to provide line of sight path to BPA's McNary Microwave Station.
500-kV Double-Circuit Transmission Loop Line	1	L=1.6 km (1-mile)	Interconnects with BPA's McNary-Slatt 500-kV line and delivers power from the plant to BPA's transmission system.
Transmission Line Towers	7	H=52 m (170 ft.)	Each transmission tower will carry two circuits (one on each side of the tower). Overhead ground wires will be attached to the top of the tower for lightning protection.
Tap Structure(s)	1	H=52 m (170 ft.)	Will look similar to the loop line towers.
Transmission Line Right-of-way	Easement	W= 45.7 m (150 ft.)	PGE will acquire the right-of-way and deed it to BPA upon completion of the line.
Clearing/Disturbance		930 sq. m (10,000 sq. ft.) at tower sites.	Only tower sites would be cleared of vegetation.

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close the electrical contacts within gas insulated breakers. The hydraulic fluid is the only toxic or hazardous material that will be used.

Transformers - Transformers change voltage. Electricity from the steam turbine generator and the gas turbine generators will be transformed to 500-kV for delivery over BPA's transmission system. Three single phase transformers will be needed for each combustion turbine. An additional single phase unit will serve as a spare transformer. The transformers each contain 45 m^3 (12,000 gal.) of cooling oil. An oil containment liner would be installed to collect and retain oil within the substation should an oil spill occur. Only newly purchased electrical equipment certified as polychlorinated biphenyl (PCB)-free would be installed.

Switches - Switches are devices used to mechanically disconnect or isolate equipment. Switches are normally on both sides of circuit breakers.

Bus Tubing, Bus Pedestals - Power moves within a substation and between breakers and other equipment on ridged aluminum pipes called bus tubing. Bus tubing is elevated by supports called bus pedestals. Buswork within the plant substation would transport the entire plant's power output to an overhead 500-kV line. This transmission line will tap into the existing McNary-Slatt 500-kV transmission line, at a point about 2.4 km (1.5 miles) southeast of the proposed site.

Substation Dead Ends - Dead ends are towers within the confines of the substation where incoming and outgoing transmission lines end. Dead ends are typically the tallest structures in a substation.

Substation Fence - This chain-link fence with razor wire bayonets on top provides security and safety. Space to maneuver construction and maintenance vehicles is provided between the fence and electrical equipment.

Substation Rock Surfacing - An 8-cm (3-inch) layer of rock selected for its insulating properties is placed on the ground within the substation to protect operation and maintenance personnel from electrical danger in the event of substation electrical failures.

Control House - Electric/electronic controls and monitoring equipment for the power system are housed in a building within the substation. Control houses are heated and air conditioned to provide a controlled environment for equipment.

Communication Facilities - BPA has an existing microwave communication network that delivers signals to operate substation equipment from control centers and other remote locations, and to report revenue metering. This network also provides voice communication from dispatchers to substation operators and maintenance personnel. Microwave communications require an unobstructed “line of sight” between antennas. A tower 38 m (125 ft.) high would be constructed at the substation for an antenna aimed toward BPA’s existing Roosevelt radio station. New communication equipment will be provided at McNary and Coyote Spring substations as well as within remote radio stations in the communication network.

Cogeneration Process and Output

The proposed plant would burn natural gas and produce electrical energy and useful heat captured as steam. Steam from the facility could be used by food processors within the Port of Morrow Industrial Park. Lamb Weston and Oregon Potato currently process potatoes using steam from in-house gas-fired boilers. PGE anticipates that when the Coyote Springs Plant becomes operational, existing boilers at the potato processors will be shut down. However, the owners of the processing plants may retain the boilers as backup units. Each unit of the Coyote Springs Plant will be able to produce up to 113 tonnes (124 tons) of steam per hour.

Water and Sewer Systems

Water Supply - Water requirements of the proposed plant will be supplied by four existing Port of Morrow wells (Carlson Sumps 1 and 2, and Port Well #3 and Port Well #4). If additional water is needed, the Port has reached an agreement with the City of Boardman for the City to supply up to an additional 7.6 m^3 (2,000 gal.) per minute (PGE, 1993). Information on status and water source of each well is provided in Table 3-2 below.

Table 3-2
Project Water Sources

Primary Water Sources				
Well Name	**Status**	**Permitted Use**	**Permitted Rate**	**Source Aquifer**
Carlson Sump #1 & 2	Existing	Municipal	3.8 cubic meters (1013 gpm)	Alluvial
Port Well #3	Existing	Municipal	3.4 cubic meters (897 gpm)	Alluvial
Port Well #4	Existing	Municipal	2.9 cubic meters (758 gpm)	Basalt
			total: 10.1cubic meters (2668 gpm)	
Backup Water Source				
Well Name	**Status**	**Permitted Use**	**Permitted Rate**	**Source Aquifer**
City of Boardman Ranney Collector	Existing	Municipal	22.8 cubic meters (6030* gpm)	Alluvial
* 2,000 gpm commitment to Coyote Springs Cogeneration Plant				

The maximum amount of water that would be required for the operation of the facility will vary depending on several factors: (1) level of plant operation; (2) cooling tower efficiency; and (3) amount of steam supplied to customers. The maximum amount of water that is required for operation of the facility is 16.5 m^3 (4,350 gal.) per minute. Actual operation of the proposed plant, however, is expected to require considerably less water. On an annual average basis, the proposed project is expected to require approximately 9.5 m^3 (2,500 gal.) per minute (PGE, 1994). Figure 3-2 illustrates how the average annual water flow would be used during operation of the plant. Figure 3-2 reveals that of the anticipated 9.5 m^3 (2,500 gal.) per minute used, 6.3 m^3 (1,660 gal.) per minute will be evaporated into the atmosphere and 2.6 m^3 (690 gal.) per minute will be discharged into the Port of Morrow's industrial wastewater system. Although not shown, 22.7 L (6 gal.) per minute will be routed into the Port's sanitary sewer system, and will then flow into the City of Boardman's sewage treatment facility.

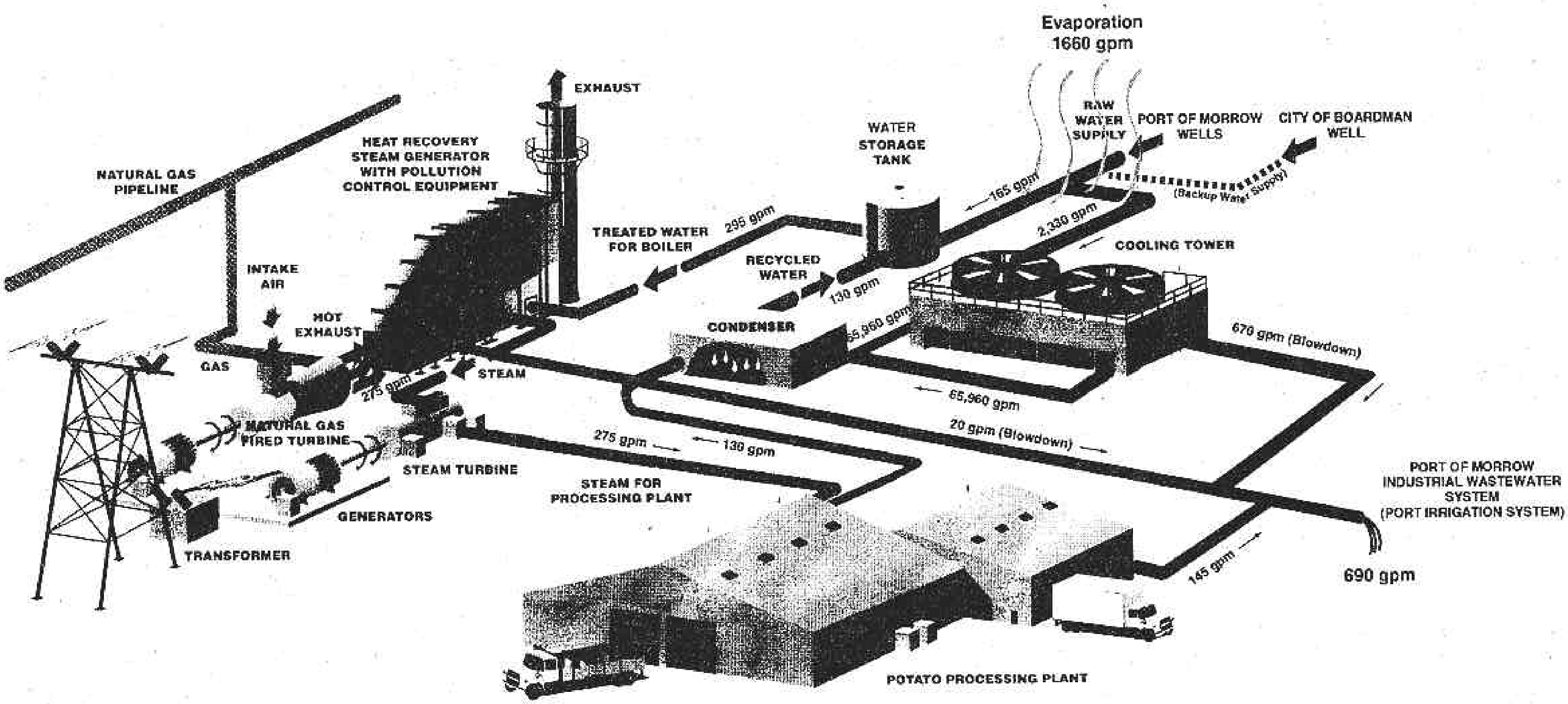
Of the 6.3 m^3 (1,660 gal.) per minute evaporated into the atmosphere from the proposed plant, approximately 4 L (1 gal.) per minute will fall back to the earth as drift. Drift is considered that part of the condensate that condenses on a surface, be it a blade of grass, the exterior of a building or an asphalt roadway.

Well Water Use - Under normal conditions Carlson Sumps 1 and 2 and Port Well #3, which draw water from the shallow ***aquifer*** wells, will provide most of the water needed for operation of the Coyote Springs Plant. These wells will provide makeup water to the cooling water basin and the condenser water system because pure water is not needed. Well water from the ***alluvial*** aquifer will also be used for miscellaneous nonpotable uses such as equipment maintenance and washdown, and fire suppression.

Demineralized Water - Water from Port Well #4 will supply the demineralized water system and potable water uses at the plant. The demineralized water system removes minerals within the raw water, then it is stored in two large tanks. Demineralized water will then be pumped from storage tanks to various services within the plant. A primary use of demineralized water is the replacement of water used in the steam cycle.

Wastewater Disposal - PGE's proposal is to discharge its wastewater to the Port of Morrow industrial wastewater system. The Port of Morrow currently dilutes industrial wastewater from the food processing plants located on Port property with well water and irrigates agricultural feed crops with the dilute mixture. About 2.6 m^3 (690 gal.) per minute of ***wastewater*** will be produced by the Coyote Springs Plant. Wastewater will be from these sources: (1) neutralized demineralized backwash water; (2) neutralized condensate polisher backwash water, and/or (3) cooling tower ***blowdown***.

Coyote Springs Cogeneration Site
Water Balance (Annual Average Flow)



Source: PGE, 1993

Figure 3-2

Plant Operation and Air Pollution Control Equipment

The combustion turbines are each expected to operate an average of 7,760 hours per year, but have the capacity to operate up to 8,760 hours per year. Auxiliary boilers are expected to operate for six weeks each spring while the turbines are shut down for maintenance (during the Columbia River fish flush operation). Auxiliary boiler operation is expected to total 2,000 hours but could be as high as 8,760 hours if a major turbine failure occurs.

The proposed facility will use best available control technology (***BACT***) to minimize pollutants emitted in significant quantities. Specific controls proposed for use at the Coyote Springs Plant are discussed below.

Oxides of Nitrogen (NO_x) - ***NO_x*** are formed by two different mechanisms during fossil fuel combustion: when nitrogen normally present in the atmosphere combines with free oxygen in the presence of heat (nitrogen fixation); and when nitrogen in the fuel stock is oxidized during combustion. Natural gas contains insignificant amounts of nitrogen, so most NO_x emitted will be from free nitrogen fixation. The majority of NO_x emitted from combustion processes is nitrous oxide (NO); the rate of conversion to nitrogen dioxide (***NO_2***) depends on the oxidizing potential of the atmosphere.

NO_x emissions will be controlled both in the turbine exhaust and in the stack. NO_x emissions from the turbines will be minimized by combining natural gas with air before combustion, thereby inhibiting a discrete flame front and reducing flame temperature. This technique is called dry low NO_x technology. Dry low NO_x technology will bring the NO_x emissions down to 25 parts per million (***ppm***). The NO_x remaining in the flue gas will be reduced to nitrogen (N_2) and water by ammonia injection at the heat recovery steam generating units through a process called selective catalytic reduction. Selective catalytic reduction can be operated at varying degrees of NO_x destruction. The more NO_x removed, the more ammonia released to the atmosphere (ammonia slippage). Eighty-two percent of the NO_x will be removed. This results in an ammonia slippage of between 10-20 ppm. A 10 ppm ammonia slip corresponds to 11.2 kg (24.4 pounds)/hour from each turbine or 177 kg (390 pounds)/8 hours. Operating at this level will bring NO_x emissions down to 4.5 ppm.

NO_x emissions from the auxiliary boilers will be controlled through the use of low NO_x burners and flue gas recirculation. Low NO_x burners have multiple combustion zones that either suppress the excess air in the primary combustion zone or control flame temperature. Flue gas recirculation reduces both the peak flame temperature and the oxygen concentration in the combustion air; both reduce NO_x formation. Together these two control technologies will reduce NO_x emissions to 40 ppm.

Carbon Monoxide (CO) - ***CO*** emissions from the turbines and from the auxiliary boilers will be minimized by the use of good combustion controls. These controls will reduce CO emissions to 15 ppm.

Sulfur Dioxide (SO_2) - The sulfur concentration in natural gas is very low (0.03-0.19 ***grains*** per 2.8 m^3 (100 cubic ft.). (California Energy Commission, 1992 and PGE, 1993). Therefore, ***SO_2*** emissions from natural gas combustion will be negligible and are limited by the facility's air contaminant discharge permit and by the sulfur content of natural gas. Good combustion controls reduce the amount of fuel required and thus limit SO_2 emissions.

Carbon Dioxide (CO_2) - The proposed facility will use the following controls to minimize CO_2 emissions: maximize efficiency, use natural gas rather than a fuel with higher carbon content, and provide steam to local food processors.

Particulate Matter - Particulate matter is generated by several mechanisms: (1) incomplete combustion; (2) nitrate (NO_3-) and sulfate (SO_3-) formation from SO_2 and NO_x; and (3) by the formation of ammonia salts during selective catalytic reduction of NO_x. Most ***particulates*** emitted from the facility will be generated from the selective catalytic reduction process. Particulate emissions from the turbines and from the auxiliary boilers will be controlled by using clean fuel (natural gas) and good combustion controls. Traditional particulate control technologies such as bag houses and scrubbers cause air pressure to drop too much for turbine operation. Projected emissions from the facility are expected to amount to 71 tonnes/year (78 tons/year).

Air Toxics - Air toxics come from impurities in the fuel, injection water, intake air and from incomplete combustion. To discourage air toxic emissions, demineralized injection water and prefiltered intake air will be used. In addition, the facility will burn natural gas (a low ash fuel), which will encourage complete combustion. Good combustion controls will also be used to limit air toxic emissions.

Continuous Emission Monitoring - In addition to the pollution controls mentioned above, the two heat recovery steam generating unit stacks will each be equipped with continuous emission monitoring systems. These systems will record NO_x, CO and ***O_2*** levels in stack emissions and provide historical evidence that emissions meet permit requirements (PGE, 1993).

Solid Waste and Toxic or Hazardous Materials

Estimated quantities of solid waste material expected to be produced during plant operation are listed in Table 3-2. Some solid waste material is classified as ***hazardous*** and would need careful handling and disposal to protect public health and safety. Section 5 describes these materials and special handling plans for them.

The cogeneration plant would use and store several toxic substances. Table 3-3 lists the materials that will be used at the Coyote Springs Plant. These substances are discussed in Section 5.

Table 3-3
Coyote Springs Cogeneration Plant - Description of Solid Waste Materials

Waste Stream	Classification	Amount	Frequency	On-Site Treatment	Storage	Off-Site Treatment/ Disposal
Used Lead Acid Batteries	Hazardous	2-cells	Once Per Year	None	90-days	Recycle to Battery Vendors
Spent SCR Catalyst Material	Hazardous	255-345 cu. m (9,000-12,000 cu. ft.)	Once Every 3-5 Years	None	None	Ship to Hazardous Waste Disposal Facility
Oily Rags, Oil Absorbent Material	Hazardous	<1 cu. m (20 cu. ft.)	Once Per Month	None	90-days	Ship to Hazardous Waste Disposal Facility
Spent Cation Demineralizer Resins	Nonhazardous	48 cu. m (1,700 cu. ft.)	Once Every 8-10 Years	None	None	Recycle to Resin Vendors
Spent Anion Demineralizer Resins	Nonhazardous	45 cu. m (1,600 cu. ft.)	Once Every 4-5 Years	None	None	Recycle to Resin Vendors
Office Waste Materials (Trash and Garbage)	Nonhazardous	>9 kg/day (>20 lb./day)	Daily	None	None	Ship to Sanitary Landfill

Table 3-4
Coyote Springs Cogeneration Plant - Toxic Fluids, Chemicals and Gases

Material Type	Purpose	Use/Time (Approximate)	Storage Volume	Storage Method	Delivery Method
Fuels					
Natural Gas	Principal Fuel	41 billion BTU's/day	None	None	Pipeline
Chemicals					
Sulfuric Acid	Water Treatment	2 cubic meters/day (570 gal./day)	129 cubic meters (34,000 gallons)	Steel Tank	Truck
Sodium Hydroxide (Caustic Soda)	Water Treatment	1.9 cubic meters/day (67 gal./day)	38 cubic meters (10,000 gallons)	Steel Tank	Truck
Phosphate/pH Control Chemical	Boiler Water Treatment	0.05 cubic meters/day (12 gal./day)	30 cubic meters (8,000 gallons)	Steel Tank	Truck
Neutralizing Amine	Corrosion Control-Boilers	0.01 cubic meters/day (3 gal./day)	.75 cubic meters (200 gallons)	Tank	Truck
Oxygen Scavenger	Corrosion Control-Boilers	0.02 cubic meters/day (6 gal./day)	1.5 cubic meters (400 gallons)	Tank	Truck
Anhydrous Ammonia	Air Pollution Control	1.6 cubic meters/day (425 gal./day)	32 cubic meters x 2 (8,500 gallons x 2)	Pressurized Tanks	Truck
Sodium Hypochlorite Bleach	Cooling Water Treatment	0.2 cubic meters/day (45 gal./day)	11.4 cubic meters (3,000 gallons)	Tank	Truck
Corrosion/Scale Inhibitor	Cooling Water Treatment	0.4 cubic meters/day (115 gal./day)	26.5 cubic meters (7,000 gallons)	Tank	Truck
Gases					
Gaseous Hydrogen	Generator Coolant	22.7 cubic meters/day (800 cu ft./day)	7.4 cubic meters x 100 (260 cubic feet x 100)	Pressurized Bottles	Truck
Carbon Dioxide	Generator Purging	NA	NA	Steel Cylinders	Truck
Lubricants/Coolants					
Lubricating Oil	Turbine Lubrication	NA	208 liters (55-gallon Drums)	Metal Drums	Truck
Hydraulic Fluid	Equipment Operation	NA	208 liters (55-gallon Drums)	Metal Drums	Truck
Insulating Oil	Electrical Equipment	NA	208 liters (55-gallon Drums)	Metal Drums	Truck
Misc. Lubricants	Equipment Operation	NA	208 liters (55-gallon Drums)	Metal Drums	Truck
Cleaning / Degreasing Agents	Equipment Cleaning	NA	208 liters (55-gallon Drums)	Metal Drums	Truck

3.1.4 Transmission Integration Facilities

Proposed Electrical Plan - Plan 5

Power from the Coyote Springs Cogeneration Plant would be integrated into BPA's transmission grid by tapping the existing 500-kV transmission line between McNary Substation and Slatt Substation. A new double-circuit 500-kV loop line would be built from the tap point to the Coyote Springs Substation, located at the plant. Switches and power ***circuit breakers*** would be installed in the Coyote Springs Substation. Microwave communication facilities to accommodate system operation would also be installed.

Initially, only one circuit breaker would be installed at Coyote Springs. When the second phase generation units are built, additional protection facilities will be installed. The estimated cost of Plan 5 is $11 million (including transmission line costs).

Proposed facilities in Plan 5 are described in greater detail below. Information about substation and transmission facilities is also provided in Table 3-1.

Coyote Springs Substation

PGE proposes to design and build the Coyote Springs Substation at the southern edge of the plant site. The substation will be built in two stages corresponding to development of the two generators. BPA and PGE engineers will coordinate closely during substation design. Substation design will meet BPA standards. (See Section 3.1.3.)

Double-Circuit 500-kV Transmission Loop Line

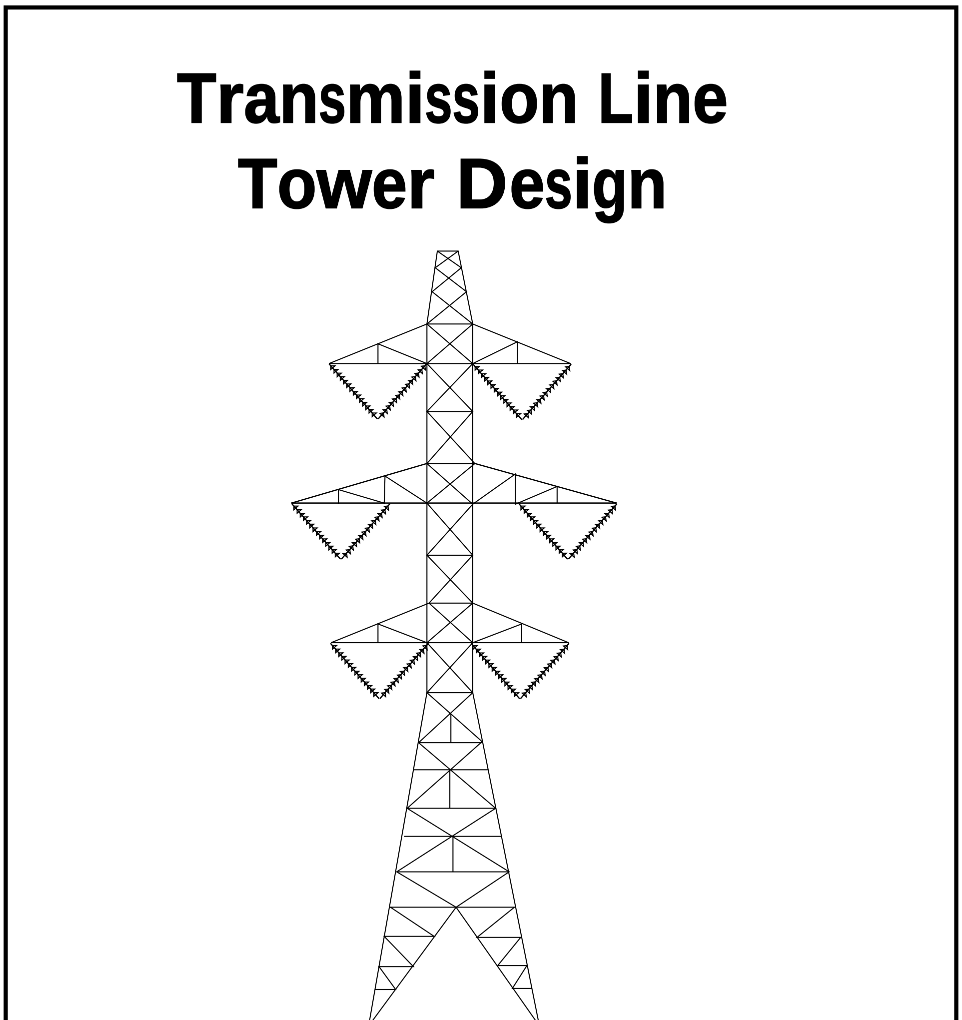
The double-circuit 500-kV transmission line will exit the plant substation and run east about 40 m (130 ft.), parallel to and north of Umatilla Electric Cooperative's existing 115-kV and 12.47-kV transmission lines to a point within an existing concrete batch plant. From this point the transmission line would turn and continue southeast to BPA's McNary-Slatt 500-kV transmission line. The double-circuit line would connect with the existing line at a point immediately north of I-84. The route of this line and tentative transmission ***tower*** sites are shown on Map 2.

Figure 3-3 illustrates a typical ***lattice steel*** 500-kV double-circuit transmission line tower. One line composed of three ***conductor*** groups, called phases, is on each side of the towers. Each phase will have three steel reinforced aluminum conductor cables. Overhead groundwires would be strung between the tops of the towers to reduce damage from lightning strikes.

Alternate Transmission Line Routes - The proposed Coyote Springs Cogeneration Plant site is very close to BPA's transmission line corridor. The tap site is located as close to the plant site as possible without requiring a crossing of I-84. Tower locations between the tap point and the plant site were selected to be accessible from existing access roads and to avoid existing wetlands.

An alternate alignment to minimize public exposure to electromagnetic fields was defined using electromagnetic field (**EMF**) calculations. This alignment passed east and north of the concrete plant building and workshop. However, it required building road access and several towers within a wetland area bordering Messner Pond. This alignment was dropped when it was discovered that the concrete plant and workshop would be relocated after the plant is built and when the aggregate quarry (next to the plant site) ceases operation.

Figure 3-3
Transmission Line Tower Design



BPA Transmission Line Tap

The existing 500-kV transmission line between BPA's McNary Substation and BPA's Slatt Substation would be interconnected with the new double-circuit loop line built by PGE. A dead-end tower would be built within the existing line to break the line into two segments. Each line segment would cross over two 230-kV lines and be attached to opposite sides of the new double-circuit line. The locations of the tap and tap line towers are shown on Map 2.

3.1.5 PGT Natural Gas Extension Pipeline

PGT proposes to construct a 29.8-km (18.5-mile), 30-cm (12-inch) pipeline from PGT's main transmission system (see Map 1). PGT has a contract with PGE to supply 41 billion BTUs of natural gas daily to the Coyote Springs Plant. The Coyote Springs Extension Pipeline is sized to carry about 100 billion BTU/day (enough for both units at Coyote Springs). The gas delivery pressure would be approximately 42 kg per square cm (600 pounds per square inch [psi]). No new compressor station would be installed on the extension.

Other pipeline facilities would include main line valves at each end of the extension and a meter station located at the cogeneration plant site. Because the proposed pipeline route would parallel existing roads for most of its distance and because of intersecting county roads, no new access roads are proposed. Local utilities would provide power to the meter station; no new supply lines would be needed. PGT proposes to rent up to 8 ha (20 acres) in the Port of Morrow Industrial Park for a temporary pipe off-loading and storage yard and a construction staging area to support the extension construction.

The permanent pipeline right-of-way would be a 11-m (35-ft.) wide easement, except where no easement is required with an existing road right-of-way. A temporary working strip, typically 9 m (30 ft.) wide, would be required during construction. The total area disturbed during construction (impact area) would be 20 m (65 ft.) wide, except on lands with special width requirements, such as canal and road/highway crossings. The permanent pipeline right-of-way would be maintained for the life of the project which is expected to exceed 30 years.

The proposed pipeline would designed and constructed in accordance with U.S. Department of Transportation Code of Federal Regulations (CFR) (49 CFR 192). Standard open cut pipeline construction methods would be used, except in several areas: where the proposed route would cross Wilson Road and I-84 to avoid traffic disruption, and where it would cross the West Extension Irrigation Canal to avoid facility damage and loss of irrigation water. Trenchless construction techniques (boring) would be used in these areas.

The pipeline would be placed in an excavated trench dug at a standard depth of 1.5 m (5 ft.) allowing for 30 cm (1 ft.) of padding material, the pipe, and 1 m (3 ft.) of cover. The standard excavation depth does not apply in the areas where trenching would not be used.

PGT used criteria for route selection that avoided adverse environmental impacts to the extent possible. In addition to the mitigation measures described in Section 5.1.3, PGT will construct the project implementing the following general mitigation measures:

- Notify and work with each property owner before construction to minimize conflicts with existing land uses. Before construction begins, landowners will be advised of fence openings and disturbances to range or farmlands, improvements, and other range or farmland use-related activities.

- Obtain all applicable permits, and work with local and state governments to avoid land use conflicts.

- Develop, monitor, and maintain an effective erosion control and restoration program.

- Develop and implement a Spill Prevention Control and Countermeasure Plan (SPCC) to minimize spills and ensure proper handling of all hazardous materials in compliance with state and Federal regulations.

- Implement an appropriate fire prevention and suppression program.

- Implement and maintain an environmental training program for all management, inspection, supervisory, and crew personnel.

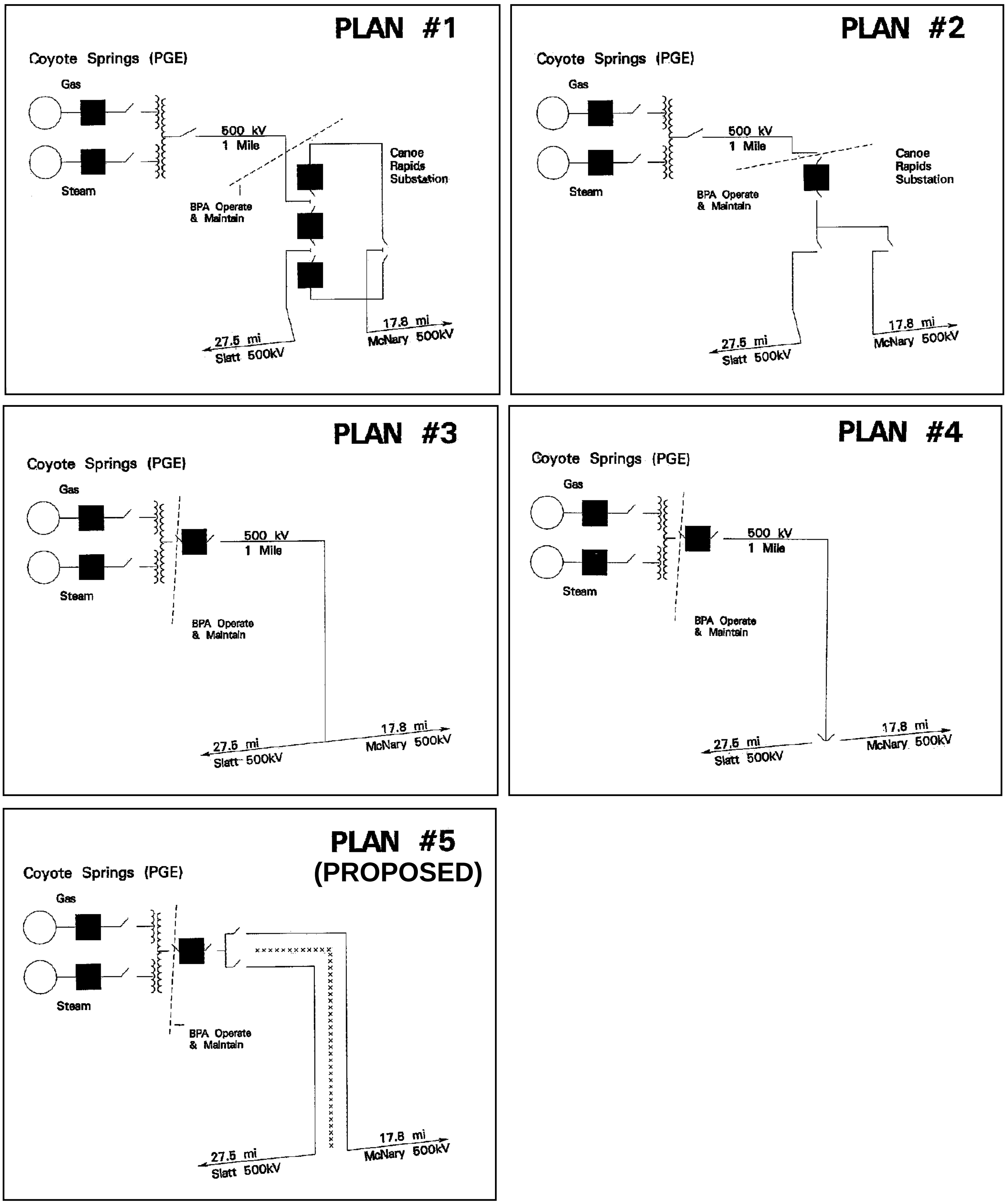
3.1.6 Electrical Plans Considered but Dropped

Five different electrical plans were considered for integrating power from Coyote Springs Plant into BPA's transmission grid (see Figure 3-4). Each plan included tapping BPA's McNary-Slatt 500-kV transmission line, and building a new 500-kV transmission line from the tap to the Coyote Springs Plant. The plans differ in degree of protection against transmission line-caused plant shut downs and initial cost. The proposed plan is Plan 5. Plans 1-4 each have undesirable aspects, such as costs or environmental concerns, which caused them to be dropped from consideration. These plans are described below.

Plan 1 - Facilities added include: (1) a 500-kV double-circuit tap to BPA's McNary-Slatt 500-kV line; (2) a new substation containing three 500-kV circuit breakers and communication facilities; (3) a single-circuit 500-kV transmission line from the substation to the Coyote Springs Plant Substation.

Plan 1 provides the greatest operational flexibility and maximum protection against transmission line outages that would cause the Coyote Springs Plant to shut down. Plan 1 would have the highest cost at $13.4 million excluding transmission line costs.

Figure 3-4
Electrical Plans Considered



Plan 2 - Plan 2 differs from Plan 1 in one respect; only one circuit breaker is provided at the substation. This plan does not protect against transmission-caused shut downs of the Coyote Springs Plant. Costs for Plan 2 are $9.7 million excluding transmission line costs.

Plan 3 - Plan 3 does not require a new substation. A tap to BPA's 500-kV McNary-Slatt line is required. A single-circuit 500-kV line would be built from the tap to the Coyote Springs Plant Substation. Existing circuit breakers at BPA's McNary and Slatt Substations, and a new 500-kV breaker at the Coyote Springs Substation would form what is called a three terminal line. These breakers de-energize the line if the line is disturbed by lightning strikes or other natural events, or during line maintenance.

This plan minimizes the cost of transmission facilities. Costs for Plan 3 are $5 million excluding transmission line costs; however, this plan does not protect against transmission-caused shut downs of the Coyote Springs Plant.

Plan 4 - Plan 4 is similar to Plan 3, but adds line sectionalizing switches at the tap point. The switches provide the ability to take a portion of the McNary-Slatt line out of service for maintenance and still allow the Coyote Springs Plant to operate. The plant and line would need to be de-energized before these switches could be operated, requiring a plant shut down. As in Plans 2 and 3, no protection is provided for transmission line disturbances that could cause the Coyote Springs Plant to shut down.

I-84 is close to the tap/switch site. Switch installations for 500-kV lines look similar to a substation and would be visible from I-84.

3.2 No Action Alternative

The No Action alternative would remove the potential impacts from the Coyote Springs Plant and related transmission facilities at the proposed site. PGE would not meet its need to find replacement power for the loss of its Trojan Nuclear Plant. Because PGE needs to find replacement power, PGE would build a similar plant at a different location or purchase power from independent power producers.

If the Coyote Springs Plant is not built, surplus capacity on BPA's transmission lines would likely be available for other power plants. Future upgrades of the transmission system to increase capacity through the area may be able to be deferred longer.

To Chapter 4